

Marcelle Soares-Santos

Curriculum Vitae

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Fermi National Accelerator Laboratory
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APPOINTMENTS FERMI NATIONAL ACCELERATOR LABORATORY (FERMILAB)

- 2010–present Research Associate
- 2009–2010 Guest Scientist
- 2008–2009 Visiting Scientist

EDUCATION

- 2010 PhD Astrophysics, University of São Paulo, São Paulo, Brazil
- 2006 MSc Astrophysics, University of São Paulo, São Paulo, Brazil
- 2004 BSc Physics, Federal University of Espírito Santo, Vitória, Brazil

AWARDS

- 2008–2009 International PhD Research Fellowship, Brazilian National Counsel of Technological and Scientific Development (CNPq)
- 2006–2010 PhD Fellowship, CNPq
- 2004–2006 MSc Fellowship, São Paulo State Research Foundation (FAPESP)
- 2001–2004 Undergraduate Research Initiation Fellowship, CNPq

RESEARCH DARK ENERGY SURVEY (DES)

- 2012–present Leading a galaxy cluster and weak lensing analysis on early DES data
- 2012–present Working on science verification, leading cluster-related tasks
- 2010–2012 Played key role on DECam construction, testing and commissioning
- 2008–2011 Developed a Voronoi Tessellation galaxy cluster finder algorithm

OTHER WORK

- 2012–present Participant of the Dark Energy Spectrometer (DESpec) collaboration
- 2012–present Participant of the Large Synoptic Survey Telescope (LSST) Dark Energy Science Collaboration
- 2009–2012 Measured cosmic shear and galaxy cluster weak lensing tomography
- 2009–2010 Contributed to the discovery of 7 strong lensing systems
- 2009–2010 Contributed to follow-up observations of galaxy clusters with serendipitous observations of the comet P/2010 A2 (LINEAR)
- 2008–2009 Obtained individual weak lensing mass estimates for nearby clusters
- 2006–2008 Developed software for analysis of wide-field images
- 2001–2006 Calculated predictions for cosmological gravitational waves

POSITIONS OF RESPONSIBILITY

- 2012–present Snowmass Young, Cosmic Frontier co-convener
- 2012–present Run Manager during DES science verification
- 2012–present DES Science Verification Squad member
- 2012 National Optical Astronomical Observatory (NOAO) Time Allocation

	Committee (TAC) for DECam science verification community time
2012	Proposal screener on the John Templeton Foundation and University of Chicago grant competition New Frontiers in Astronomy and Cosmology
2011–present	DES Data Management requirements verification ad-hoc committee
2010–present	DECam expert during integration, commissioning and operations
2010–present	Chair of weekly Chalk Talk series, Fermilab
2009–2010	Co-chair of weekly Munch journal club, Fermilab
OBSERVING EXPERIENCE	
	2012–present DES observer, Cerro Tololo Inter-American Observatory, Chile, Blanco 4m imaging with DECam (multiple runs, ~20 nights)
	2009–2010 Galaxy clusters follow-up observations, Kitt Peak National Observatory WIYN 3.5m imaging with MiniMo (2 runs, 15 nights)
	2008–2009 Follow-up observations of strong arc candidate systems, Apache Point Observatory 2.5m remote observing (2 nights)
STUDENTS SUPERVISED	
	2011–2012 Savanna Rutas (Illinois Mathematics and Science Academy, IMSA)
	2009 Raktim Sarma (University of Texas at Dallas), Summer 2009
	2008 Dylan Nelson (University of California Berkeley), Summer 2008
	2008–2009 Francis Hardin, Kelsey Lawhorn, Liana Nicklaus, Tony Yunker (IMSA)
TEACHING EXPERIENCE	
	2005–2006 Fundamentals of Astrophysics, Introduction to Astronomy. University of São Paulo, Teaching Assistant
	2001–2003 Physics, Mathematics. Espírito Santo State Office of Education in Vitória, High-School Teacher
OUTREACH	
	2012 Invited talk about DES at the Naperville Astronomical Association, Oct 2
	2012 Keynote address to 1500 3rd, 4th and 5th graders participants a science competition supported by the In Search of Genius Foundation, Jun 3
	2010–2012 Maintained the DES public webpages and blogged at Quantum Diaries.
	2010 Presentation about Astronomy and Particle Physics to 70 kindergarten students at Saints Peter & Paul School, Naperville IL, May 7
	2008–2012 Volunteered to give talks to high-school students visiting Fermilab.
	2000–2003 Organized the university annual Physics fair in Espírito Santo, Brazil.
MEMBERSHIPS	
	2012 International Society for Optics and Photonics (SPIE)
	2010 American Physical Society (APS)
	2009 American Astronomical Society (AAS)
	2005 Brazilian Astronomical Society (SAB)
CONFERENCES	
	2012 ICHEP 2012, Melbourne, Australia, Jul 4–11. The Dark Energy Survey: status and science prospects, Proc. of Science, in prep.
	2012 SnowPAC 2012, Snowbird UT, Mar 18–23. Weak lensing analyses in the SDSS Stripe 82 Coadd
	2011 TAUP 2011, Munich, Germany, Sep 5–9. Dark Energy physics expectations at DES, J. Phys. Conf. Series, 375, 032006 (2012)

- 2011 TIPP 2011, Chicago IL, Jun 9–14. DECam integration tests on telescope simulator, Phys. Proc., 37, 1445 (2012)
- 2011 AAS Meeeting, Seattle WA, Jan 9–13. Calibration Of The Dark Energy Survey Camera: Measurements Of Focal Plane Flatness And Crosstalk Among CCDs
- 2010 SAB Meeting, Passa Quatro, Brazil, Sep 7–12. Galaxy clusters in SDSS data
- 2008 3rd Biennial Leopoldina Conference, Munich, Germany, Oct 7–11. Cosmography with Galaxy Clusters
- 2008 SDSS International Symposium, Chicago IL, Aug 15–18. Improved cluster finding with Voronoi Tessellations. Support: Sloan Foundation
- 2008 ICHEP08, Philadelphia PA, Jul 29 – Aug 5. Cosmography with Galaxy Clusters, arXiv: 0810.3689. Support: Princeton University and Univeristy of Pennsylvania
- 2007 SAB Meeting, Passa Quatro, Brazil, Sep 2–6. Dark Energy and galaxy clusters
- 2007 New Physics in Space Workshop, Campos do Jordão, Brazil, Feb 4–9. Galaxy clusters shedding light on dark energy
- 2006 SAB Meeting, Atibaia, Brazil, Aug 1–3. Primordial gravitational waves
- 2006 New Physics in Space Workshop, Campos do Jordão, Brazil, Feb 19–24. Gravitational Waves and Dark Energy.
- 2005 100 years of Relativity, São Paulo, Brazil, Aug 22–24. Primordial gravitational waves in a Dark Energy dominated Universe, Braz. J. of Phys. 35, 1191 (2005)
- 2005 New Physics in Space Workshop, Campos do Jordão, Brazil, Feb 20–25. Gravitational Waves and the expansion of the Universe
- 2005 SAB Meeting, Brazil, Aug 1–4. Cosmic Gravitational Waves and Dark Energy
- 2004 Magnetic Fields in the Universe, Angra dos Reis, Brazil, Nov 22–30. Modeling the spectrum of gravitational waves in the primordial Universe, AIP Conf. Proc. 784, 800 (2005)

**INVITED
SEMINARS
& TALKS**

- 2012 DES Commissioning Status, Fermilab All Experimenters' Meeting, Oct 1 2012
- 2012 DES Status & Science, Physics Department, University of São Paulo, Apr 2012
- 2012 Weak lensing with the SDSS Coadd and implications for DES, Kavli Institute for Cosmological Physics, University of Chicago, Feb 2012
- 2011 DES Status and Prospects for Dark Energy Physics from Galaxy Clusters, High Energy Physics Department, Argonne National Laboratory, Nov 2011
- 2011 Cosmology in the Dark Energy Survey Era, Physics Department, Federal University of Espírito Santo, São Mateus, Brazil, Apr 2011
- 2011 Cosmology in the Dark Energy Survey Era, Physics Department, University of Texas at El Paso, Mar 2011
- 2010 Observational Cosmology, Fermilab Users' Annual Meeting, Jun 2–3 2010.
- 2010 Galaxy cluster analysis in the SDSS Coadd and DES, Kavli Institute for Particle Astrophysics & Cosmology, SLAC National Laboratory, Feb 2010

- 2010 Galaxy cluster analysis in the SDSS Coadd and DES, Center of Cosmology & Astroparticle Physics, Ohio State University
- 2010 Galaxy cluster analysis in the SDSS Coadd and DES, Physics department, University of Michigan, Feb 2010
- 2010 Galaxy cluster analysis in the SDSS Coadd and DES, Center for Particle Astrophysics, Fermilab, Jan 2010
- 2009 Gearing up for cosmological constraints from deep galaxy cluster samples, Physics Department, University of Michigan, Jul 2009
- 2009 Galaxy clusters and Dark Energy, Physics Department, University of California at Davis, Jan 2009
- 2008 Cosmology with galaxy clusters, Physics Department, Federal University of Espírito Santo, Brazil, Feb 2008

SCHOOLS

- 2012 Excellence in Detectors and Instrumentation Technologies (EDIT) School, Fermilab, Batavia IL, Feb 13–24
- 2008 The Onassis Foundation Lectures in Physics, Cosmology: an astrophysical perspective, Heraklion, Crete, Greece, Jun 30 – Jul 4. Travel support: Onassis Foundation.
- 2007 1st Annual School of the European Network UniverseNet, The Origin of the Universe, Mytilini, Lesbos, Greece, Sep 24–29. Travel Support: Brazilian Federal Agency for Support and Evaluation of Graduate Education (CAPES).
- 2005 Advanced Course of the Brazilian National Institute for Space Research, A Roadmap for Cosmology, São José dos Campos, Brazil, Sep 9–14

PUBLICATIONS

REFEREED JOURNAL ARTICLES

- 2012 1. Annis, J., **Soares-Santos, M.**, Strauss, M., Becker, A., Dodelson, S., Fan, X., Gunn, J., Hao, J., Ivezić, Z., Jester, S., Jiang, L., Johnston, D., Kubo, J., Lampeitl, H., Lin, H., Lupton, R., Miknaitis, G., Seo, H-J., Simet, M., Yanny, B. *The SDSS Coadd: 275 deg² of Deep SDSS Imaging on Stripe 82*. ApJ in review, arXiv:1111.6619
- 2012 2. Lin, H., Dodelson, S., Seo, H-J., **Soares-Santos, M.**, Annis, J., Hao, J., Johnston, D., Kubo, J., Reis, R., Simet, M. *The SDSS Coadd: Cosmic Shear Measurement*. ApJ 761, 15, 2012.
- 2012 3. Simet, M., Kubo, J., Dodelson, S., Annis, J., Hao, J., Johnston, D., Lin, H., Reis, R., **Soares-Santos, M.**, Seo, H-J. *The Sloan Digital Sky Survey Co-add: Cross-correlation Weak Lensing and Tomography of Galaxy Clusters*. ApJ 748, 128, 2012.
- 2012 4. Reis, R., **Soares-Santos, M.**, Annis, J., Dodelson, S., Hao, J., Johnston, D., Kubo, J., Lin, H., Seo, H-J., Simet, M. *The Sloan Digital Sky Survey Co-add: A Galaxy Photometric Redshift Catalog*. ApJ 747, 59, 2012.
- 2011 5. **Soares-Santos, M.**, de Carvalho, R., Annis, J., La Barbera, F., Gal, R., Lopes, P., Wechsler, R., Busha, M., Gerke, B. *The Voronoi Tessellation Cluster Finder in 2+1 Dimensions*. ApJ 727, 45, 2011.

- 2010 6. Kubo, J., Allam, S., Drabek, E., Lin, H., Tucker, D., Buckley-Geer, E., Diehl, T., **Soares-Santos, M.**, Hao, J., Annis, J., Frieman, J., Wiesner, M., West, A., *The Sloan Bright Arcs Survey: Discovery of Seven New Strongly Lensed Galaxies from $z = 0.66 - 2.94$* . ApJL 724, L137, 2010.
- 2009 7. Kubo, J., Annis, J., Hardin, F., Junker, T., Kubik, D., Lawhorn, K., Lin, H., Reis, R., Seo, H. **Soares-Santos, M.**, Stebbins, A. *The Sloan nearby cluster weak lensing survey*. ApJL 702, 110, 2009.
- 2008 8. La Barbera, F., de Carvalho, R., Kohl-Moreira, J., Gal, R., **Soares-Santos, M.**, Capaccioli, M., Santos, R., Sant'Anna, N. *2DPHOT: a multi-purpose environment for the two-dimensional analysis of wide-field images*. PASP 120, 868, 2008.
- 2004 9. Fabris, J., Gonçalves, S., **Soares-Santos, M.** *Gravitational Waves in the Generalized Chaplygin Gas Model*. GRG 36, 2559, 2004.

REFEREED CONFERENCE PROCEEDINGS

- 2012 10. Flaugher, B. et al. *Status of the Dark Energy Survey Camera (DECam) Project*. SPIE Meeting, Amsterdam, 2012. Proc. SPIE, 8446, 11, 2012.
- 2012 11. Honscheid, K. et al. *The readout and control system of the Dark Energy Camera*. SPIE Meeting, Amsterdam, 2012. Proc. SPIE, 8451, 12, 2012.
- 2012 12. **Soares-Santos, M.** et al. *DECam integration tests on telescope simulator*. TIPP, Chicago IL, 2011. Phys. Proc., 37, 1445, 2012.
- 2012 13. **Soares-Santos, M.** *Dark energy physics expectations at DES*. TAUP, Munich, Germany, 2011. J. Phys. Conf. Series, 375, 032006, 2012.
- 2005 14. **Soares-Santos, M.** et al. *Gravitational waves: a 100 year-tool applied to the dark energy problem*. 100 years of Relativity, São Paulo, Brazil, 2005. Braz. J. of Phys. 35, 1191, 2005.
- 2005 15. **Soares-Santos, M.** et al. *Modeling the spectrum of gravitational waves in the primordial Universe*. Magnetic Fields in the Universe: from laboratory and stars to primordial structures, Angra dos Reis, Brazil, 2004. AIP Conf. Proc., 784, 800, 2005.

OTHER PUBLICATIONS

- 2012 16. Abate, A., et al. *Large Synoptic Survey Telescope: Dark Energy Science Collaboration*. arXiv:1211.0310
- 2012 17. Abdalla, F., et al. *The Dark Energy Spectrometer (DESpec): A Multi-Fiber Spectroscopic Upgrade of the Dark Energy Camera and Survey for the Blanco Telescope*. arXiv:1209.2451
- 2010 18. Jewitt, D., Annis, J., **Soares-Santos, M.** *Comet P/2010 A2 (LINEAR)*. IAU Circ., 9109, 3, 2010. Edited by Green, D.
- 2010 19. de Carvalho, R. R., et al. *The Brazilian Virtual Observatory – A New Era for Astronomy*. JCIS, 1, 187, 2010.
- 2008 20. **Soares-Santos, M.**, de Carvalho, R., La Barbera, F., Lopes, P., Annis, J. *Cosmography with Galaxy Clusters*. Proceedings ICHEP08, Philadelphia, 2008. arXiv: 0810.3689.
- 2006 21. **Soares-Santos, M.**, de Gouveia Dal Pino, E. *The evolution of primordial gravitational waves*. arXiv:astro-ph/0608152